SECTION 05715

FABRICATED SPIRAL STAIR

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes factory-fabricated spiral stair with central-supporting steel columns and radiating treads.

B. Related Sections:
   1. Division 9 Section "Painting" for field painting spiral stair.

1.2 PERFORMANCE REQUIREMENTS

A. General: In engineering spiral stairs to withstand structural loads indicated, determine allowable design working stresses of materials based on the following:
   1. For Structural Steel: AISC's "Specification for Structural Steel Buildings Allowable Stress Design and Plastic Design with Commentary."

B. Structural Performance: Provide spiral stairs capable of withstanding structural loads required by ASCE 7 without exceeding the allowable design working stress of the materials involved, including anchors and connections.
   1. Comply with requirements for other than 1- and 2-family dwellings.
   2. For platforms, comply with requirements for stair treads.

1.3 SUBMITTALS

A. Product Data: Include installation instructions and data for accessories.

B. Shop Drawings: Show details of fabrication and installation.
   1. Include setting drawings and templates for anchor bolts and other anchorage devices.
   2. For installed stairs indicated to comply with certain design loadings, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 QUALITY ASSURANCE

A. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of kind indicated. Engineering services are defined as those performed for installations of products that are similar to those indicated for this Project in material, design, and extent.

B. Welding Standards: Comply with applicable provisions of AWS D1.1, "Structural Welding Code--Steel."
   1. Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone recertification.

1.5 COORDINATION

A. Coordinate installation of anchorages for spiral stairs. Furnish setting drawings, templates, and directions for installing anchorages, including concrete inserts, weld plates, and anchor bolts, that are to be embedded in concrete or masonry construction. Deliver such items to Project site in time for installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Iron Shop.
   2. Salter Industries.
   3. Spiral Stairs of America.

2.2 MATERIALS

A. Metal Surfaces: For exposed surfaces, provide materials selected for their surface flatness, smoothness, and freedom from surface blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.

B. Steel Plates, Shapes, and Bars: ASTM A 36.

C. Rolled Steel Floor Plate: ASTM A 786.

D. Steel Pipe Columns: ASTM A 53, Schedule 40. Provide Schedule 80 for columns more than 4-1/2 inches in OD and where required to support loads.

2.3 MISCELLANEOUS MATERIALS

A. Fasteners: For connecting stair components and for anchoring stairs to other construction, select fasteners of the type, grade, and class required to produce connections capable of withstanding design loadings.
   1. For steel and cast iron, use plated fasteners complying with ASTM B 633, Class Fe/Zn 25 for electrodeposited zinc coating.

B. Shop Primer for Galvanized Steel: Zinc-dust, zinc-oxide primer formulated for use over zinc-coated metal and compatible with finish paint systems indicated, complying with SSPC-Paint 5.

2.4 FABRICATION

A. Form exposed work true to line and level with accurate angles and surfaces and edges straight or curved as indicated. Ease exposed edges to a radius of approximately 1/32 inch, unless otherwise indicated. Bend metal to smallest radius that will not cause grain separation or otherwise impair work.

B. Shop assemble stair units to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

C. Weld connections continuously to comply with the following:
   1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
   2. Obtain fusion without undercut or overlap.
   3. Remove welding flux immediately.
   4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and, except for fillet welds, contour of welded surface matches those adjacent.

D. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Locate joints where least conspicuous. Use Phillips flat-head (countersunk) screws or bolts where exposed fasteners are required.

E. Fabricate center column from steel or aluminum pipe welded to base plate for anchorage to floor structure. Brace column at upper floors by means of landings attached to column and floor structure, unless otherwise indicated. Provide cap for column if top is exposed.

F. Provide formed steel-plate treads and platforms welded to hubs or center column and as follows:
   1. Tapered flanges without legs.
   2. Rolled steel-floor-plate wearing surfaces.

G. Railings: Provide railing system indicated, uniformly bent to spiral shape, and continuing at top to form guard rail around floor opening.
   1. Fabricate top rail from steel pipe.
   2. Fabricate balusters from square steel bars.

2.5 STEEL AND IRON FINISHES

A. Galvanized Finish: Hot-dip galvanize stairs after fabrication to comply with ASTM A 123.

B. Preparation for Shop Priming: After galvanizing, thoroughly clean railings of grease, dirt, oil, flux, and other foreign matter, and treat with metallic phosphate process.

C. Apply shop primer to prepared surfaces of handrails and railing components, unless otherwise indicated. Comply with requirements of SSPC-PA 1, "Paint Application Specification No. 1," for shop painting.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing spiral stairs to in-place construction; include threaded fasteners for concrete and masonry inserts, through-bolts, lag bolts, wood screws, and other connectors as required.

B. Assemble spiral stair components to comply with manufacturer's written instructions, with each component aligned and in correct relation to each other, securely anchored to the supporting column and adjacent structure.

C. Do not cut, alter, or drill stair components in the field that do not fit properly. Return components that do not fit to the manufacturer for adjustment.

D. Install spiral stairs accurately in location, alignment, and elevation; level and plumb; and according to manufacturer's written instructions.

E. Install spiral stairs by welding to steel structure or to weld plates cast into concrete, unless otherwise indicated.

F. Field Welding: Comply with the following requirements:
   1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
   2. Obtain fusion without undercut or overlap.
   3. Remove welding flux immediately.
   4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces.

3.2 CLEANING AND PROTECTING

A. For galvanized surfaces, clean field welds, bolted connections, and abraded areas and repair galvanizing according to ASTM A 780.
   1. Paint repaired areas with same material used for shop painting.

END OF SECTION 05715